1. A device comprising:

a base comprising a plurality of apertures, and a top surface and a bottom surface;

two liquid impermeable membranes, wherein one membrane is secured to the top surface of the base and the other membrane is secured to the bottom surface of the base, wherein the membranes are secured to the base in forming a liquid-tight sealing, and wherein at least one of the membranes is gas permeable; and

the plurality of apertures comprises one or more sets of apertures, wherein a set of apertures comprises a microchamber with a fluid flow groove, a vent aperture, and a filling port, wherein the microchamber and vent aperture are in airflow communication, and wherein the fluid flow groove comprises fluid flow communication between the microchamber and the filling port of the set in providing for flow of a fluid, when introduced into the filling port, to access the microchamber of the set.

2. The device according to claim 1, wherein both liquid impermeable membranes are gas permeable.

3. The device according to claim 1, wherein the at least one gas-permeable membrane is a single gas permeable membrane secured to the bottom surface of the base.

4. The device according to claim 1, further comprising one or more lids detachably secured to the device.

5. The device according to claim 4, wherein a lid of the one or more lids further comprises a vacuum port.

6. The device according to claim 1, wherein the at least one gas permeable membrane has been treated by ionization.

7. The device according to claim 1, wherein in a set of apertures, a liquid-tight sealing is formed around the filling port, and a liquid tight sealing is formed around the microchamber and the vent aperture.

8. The device according to claim 1, wherein in a set of apertures, a liquid-tight sealing is formed around the filling port and the microchamber with fluid flow groove and the vent aperture.

9. The device according to claim 1, wherein in a set of apertures, a liquid-tight sealing is formed around the filling port and the microchamber with fluid flow groove.

10. The device according to claim 1, wherein the filling port comprises a walled passage comprising a conical shape for receiving a tip of a pipette.

11. The device according to claim 1, wherein the vent aperture extends from the top surface of the base to the bottom surface of the base.

12. The device according to claim 11, wherein the device further comprises a venting channel, wherein the venting channel is in airflow communication with each vent aperture.

13. The device according to claim 1, wherein the vent aperture comprises a single opening formed in the top surface of the base.

14. The device according to claim 1, further comprising a venting system for each set of apertures, wherein the venting system comprises a vent aperture and one or more vent holes formed in the membrane covering the vent aperture.

15. The device according to claim 1, further comprising a venting system for each set of apertures, wherein the venting system comprises a vent aperture, a venting channel, and one or more vent holes, wherein the venting channel provides airflow communication between the vent aperture and the one or more vent holes.

16. The device according to claim 1, wherein the microchamber comprises: an upper opening in the top surface of the base and a lower opening in the bottom surface of the base, wherein the lower opening is in fluid flow communication with the fluid flow groove; and a chamber defined by a sidewall, a portion of the membrane secured to the upper surface of the base which portion covers the upper opening, and a portion of the membrane secured to the lower surface of the base which portion covers the lower opening.

17. The device according to claim 1, wherein the plurality of apertures comprises a plurality of sets of apertures, and wherein the device comprises a number of microchambers ranging from about 24 microchambers to about 144 microchambers.

18. The device according to claim 1, wherein the device further comprises a plurality of septums, each septum being inserted into an aperture.

19. The device according to claim 1, wherein the membranes are of optical transparency and clarity sufficient for permitting the device to be used in an assay having microscopic or spectroscopic analysis.

20. A device comprising:

a base comprising a plurality of sets of apertures, and a top surface and a bottom surface;

two liquid impermeable membranes, wherein one membrane is secured to the top surface of the base and the other membrane is secured to the bottom surface of the base, wherein the membranes are secured to the base in forming a liquid-tight sealing, and wherein at least one of the membranes is gas permeable;

wherein a set of apertures, of the plurality of sets of apertures, comprises a microchamber with a fluid flow groove, a vent aperture, and a filling port, wherein the microchamber and vent aperture are in airflow communication, and wherein the fluid flow groove comprises fluid flow communication between the microchamber and the filling port of the set in providing for flow of a fluid, when introduced into the filling port, to access the microchamber of the set;

wherein the vent aperture comprises one or more openings selected from the group consisting of an opening in the top surface of the base and an opening in the bottom surface of the base, and a single opening in the top surface of the base; and

a venting system comprising a vent aperture, and one or more vent holes which allow passage of air therethrough.

21. The device according to claim 20, wherein both liquid impermeable membranes are gas permeable.

22. The device according to claim 20, wherein the at least one gas permeable membrane is a single gas permeable membrane secured to the bottom surface of the base.

23. The device according to claim 20, wherein the device further comprises one or more lids detachably secured thereto.

24. The device according to claim 23, wherein a lid of the one or more lids further comprises a vacuum port.

25. The device according to claim 20, wherein the at least one gas permeable membrane has been treated by ionization.

26. The device according to claim 20, wherein in a set of apertures, a liquid-tight sealing is formed around the filling port, and a liquid tight sealing is formed around the microchamber and the vent aperture.

27. The device according to claim 20, wherein in a set of apertures, a liquid-tight sealing is formed around the filling port and the microchamber with fluid flow groove and the vent aperture.

28. The device according to claim 20, wherein in a set of apertures, a liquid-tight sealing is formed around the filling port and the microchamber with fluid flow groove.

29. The device according to claim 20, wherein the filling port comprises a walled passage comprising a conical shape for receiving a tip of a pipette.

30. The device according to claim 20, wherein the venting system further device comprises a venting channel located between each vent aperture and the one or more vent holes.

31. The device according to claim 20, wherein the microchamber comprises: an upper opening in the top surface of the base and a lower opening in the bottom surface of the base, wherein the lower opening is in fluid flow communication with the fluid flow groove; and a chamber defined by a sidewall, a portion of the membrane secured to the upper surface of the base which portion covers the upper opening, and a portion of the membrane secured to the lower surface of the base which portion covers the lower opening.

32. The device according to claim 20, wherein the device further comprises a plurality of septums, each septum being inserted into an aperture.

33. The device according to claim 20, wherein the membranes are of optical transparency and clarity sufficient for permitting the device to be used in an assay having microscopic or spectroscopic analysis.

34. A device comprising:

a base having a plurality of apertures, wherein the base has secured thereto in a liquid-tight sealing, and is sandwiched between, two membranes in forming a plurality of microchambers, wherein at least one of the membranes is gas permeable;

microfluidics which provides for introducing fluid into each microchamber of the plurality of microchambers without direct access to the microchambers, wherein the microfluidics

comprises a separate filling port in fluid flow communication with each microchamber; and

a venting system for providing flow of air out of the device during a process of introducing fluid into the microchambers.

35. The device according to claim 34, wherein the venting system for each microchamber comprises a vent aperture in airflow communication with the microchamber, and one or more vent holes formed in a portion of the membrane covering the vent aperture.

36. The device according to claim 34, wherein the venting system for each microchamber comprises a vent aperture, a venting channel, and one or more vent holes, wherein the venting channel provides airflow communication between the vent aperture and the one or more vent holes.

37. The device according to claim 34, wherein the device further comprises one or more lids detachably secured thereto.

38. The device according to claim 37, wherein a lid of the one or more lids further comprises a vacuum port.

39. A method for introducing a fluid into a plurality of microchambers of the device according to claim 1, wherein the device comprises a plurality of sets of apertures, the method comprising: (a) aligning a plurality of pipette tips with a plurality of filling ports of the device; (b) introducing each pipette tip, of a plurality of pipette tips, into the filling port with which it is aligned; (c) dispensing a fluid from each pipette tip according to step (b) wherein the fluid dispensed into each filling port flows through the filling

port, along the fluid flow groove, through a lower opening of the microchamber, and into the microchamber; and (d) venting air, displaced by the fluid flowing in the device, by providing airflow communication between the microchamber and a vent aperture.

40. The method according to claim 39, wherein in the process of introducing each tip into the filling port with which it is aligned, each tip is inserted through a material selected from the group consisting of a membrane, a septum, and a combination thereof.

41. The method according to claim 39, wherein the device further comprises one or more vent holes in airflow communication with the vent aperture, and wherein venting air further comprises the passage of air through the vent aperture and one or more vent holes.

42. The method according to claim 39, wherein the device further comprises a venting channel located between, and in airflow communication with, the vent aperture and one or more vent holes, and wherein venting air further comprises the passage of air through the vent aperture, the venting channel, and the one or more vent holes.

43. A method for introducing a fluid into a plurality of microchambers of the device according to claim 20, the method comprising: (a) aligning a plurality of pipette tips with a plurality of filling ports of the device; (b) introducing each pipette tip, of a plurality of pipette tips, into the filling port with which it is aligned; (c) dispensing a fluid from each pipette tip according to step (b) wherein the fluid

dispensed into each filling port flows through the filling port, along the fluid flow groove, through a lower opening of the microchamber, and into the microchamber; and (d) venting air, displaced by the fluid flowing in the device, by providing airflow communication between the microchamber and a vent aperture.

44. The method according to claim 43, wherein in the process of introducing each tip into the filling port with which it is aligned, each tip is inserted through a material selected from the group consisting of a membrane, a septum, and a combination thereof.

45. The method according to claim 43, wherein the device further comprises one or more vent holes in airflow communication with the vent aperture, and wherein venting air further comprises the passage of air through the vent aperture and one or more vent holes.

46. The method according to claim 43, wherein the device further comprises a venting channel located between, and in airflow communication with, the vent aperture and one or more vent holes, and wherein venting air further comprises the passage of air through the vent aperture, the venting channel, and the one or more vent holes.

47. A device containing a fluid introduced by the method according to claim 39.

48. A device containing a fluid introduced by the method according to claim 41, wherein the device further comprises

a lid detachably secured to a bottom surface of the device, and wherein the lid further comprises a vacuum port.

49. A device containing a fluid introduced by the method according to claim 42, wherein the device further comprises a lid detachably secured to a bottom surface of the device, and wherein the lid further comprises a vacuum port.

50. A device containing a fluid introduced by the method according to claim 43.

51. A device containing a fluid introduced by the method according to claim 45, wherein the device further comprises a lid detachably secured to a bottom surface of the device, and wherein the lid further comprises a vacuum port.

52. A device containing a fluid introduced by the method according to claim 46, wherein the device further comprises a lid detachably secured to a bottom surface of the device, and wherein the lid further comprises a vacuum port.

53. A method for removing fluid from the device according to claim 48, the method comprising:

hooking up the vacuum port to a vacuum source; and

applying a vacuum to the device, wherein the vacuum draws fluid contained within the device to flow through the vent aperture and the one or more vent holes in removing fluid from the device.

54. A method for removing fluid from the device according to claim 49, the method comprising:

hooking up the vacuum port to a vacuum source; and

applying a vacuum to the device, wherein the vacuum draws fluid contained within the device to flow through the vent aperture, venting channel, and the one or more vent holes, in removing fluid from the device.

55. A method for removing fluid from the device according to claim 51, the method comprising:

hooking up the vacuum port to a vacuum source; and

applying a vacuum to the device, wherein the vacuum draws fluid contained within the device to flow through the vent aperture and the one or more vent holes in removing fluid from the device.

56. A method for removing fluid from the device according to claim 52, the method comprising:

hooking up the vacuum port to a vacuum source; and

applying a vacuum to the device, wherein the vacuum draws fluid contained within the device to flow through the vent aperture, venting channel, and the one or more vent holes, in removing fluid from the device.